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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/735,592	12/12/2000	Michael Wayne Brown	AUS9-2000-0720-US1	8578

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EXAMINER

ALI, SYED J

ART UNIT	PAPER NUMBER
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2195

DATE MAILED: 08/01/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/735,592

Applicant(s)

BROWN ET AL.

Examiner

Syed J. Ali

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 May 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

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DETAILED ACTION

1. This office action is in response to the amendment filed May 3, 2005. Claims 1-22 are presented for examination.

2. The text of those sections of Title 35, U.S. code not included in this office action can be found in a prior office action.

Claim Rejections - 35 USC § 101

3. **Claims 10-18 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.**

4. As per claims 10, 14, and 17, the claimed "apparatus" is non-statutory as it is not tangibly embodied, in that it fails to include any hardware as part of the apparatus. The apparatus could be implemented entirely in software. Claims 11-13, 15-16, and 18 are rejected for at least the same reasons as presented for their parent claims, as they fail to present any limitations that resolve the deficiencies of the claims from which they depend.

Claim Rejections - 35 USC § 103

5. **Claims 1-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bonachea ("Bulk File I/O Extensions to Java").**

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6. As per claims 1-4, Bonachea teaches the invention as claimed, including a method for asynchronous execution within a program, comprising:

executing code in a first thread (§ 4.2);

determining whether a first keyword exists in the code, the first keyword being a flag indicating that a subsequent code element following the first keyword may be executed out of order (§§ 4.1.1 - 4.1.3);

executing the code element in a second thread (§ 4.1.2), wherein the first thread is executed on a first processor and the second thread is executed on a second processor (§ 2.2); and

wherein the code element is one of an instruction, block, and a method (Fig. 2) and the first keyword is usable in both an internal definition of a method and a type definition for the method (Figs. 2-3 and 5, wherein the AsyncFile extension is designed as a class, which can be used as an object type or a return type).

7. While Bonachea does not specifically recite spawning a new thread in response to encountering a keyword during the executing of the code, it would have been obvious to one of ordinary skill in the art that such is well within the bounds of what is disclosed by Bonachea. Bonachea implements a library that supports asynchronous I/O for Java, but tested the results using a dialect of Java without a JVM. There is nothing to suggest that the extensions could not be used in Java; the library is designed with such a use in mind. As is well-known in the art, there are several ways that Java code can be executed, including by interpretation, just-in-time compiling, or fully compiling code before it is executed. If interpretation was chosen, the creation of a new thread would occur at runtime; in the embodiment shown by Bonachea, the runtime data structures are created

at compile time, which is nothing more than a design choice. Java easily supports each type of execution.

8. It is also noted that Bonachea does not support conventional multithreading, whereby asynchronous threads of control may be created (§ 2.2). However, this is a limitation of the Titanium compiler chosen by Bonachea to implement the asynchronous extensions, not of Java itself. In fact, the use of multiple threads of control is a well-known feature of Java, but may be limited by the underlying architecture that is chosen. Nonetheless, it is well-known that there are a myriad of scheduling choices that can be made with regard to how threads are executed, i.e. multiple threads on a single processor or one thread per processor, as claimed. Stanbach (US 2001/0049747) discusses how threads may be executed on the same or different processors, depending on the particular needs of the chosen implementation (paragraph 0046).

9. As per claims 5-6, Bonachea teaches the invention as claimed, including a method for asynchronous execution within a program, comprising:

executing code in a first thread (§ 4.2);

determining whether a first keyword exists in the code, the first keyword indicating a code element that may be executed out of order (§§ 4.1.1 - 4.1.3);

executing the code element in a second thread (§ 4.1.2);

determining whether a second keyword exists in the code, the second keyword indicating that execution of the code element in the second thread must complete before a next code element immediately following the second keyword is executed (§ 4.1.3, wherein the “Done” methods provide a means of synchronizing the asynchronous operations by requiring the I/O operations be complete before execution continues; that the “Done” method operates by polling is immaterial, as the claim limitation only requires the keyword require the asynchronous operation to complete before execution may progress);

executing the next code element in the first thread after execution of the code element in the second thread completes (§ 4.1.3);

determining whether a third keyword exists in the code element, the third keyword indicating a statement that may be executed out of order (§§ 4.1.1 - 4.1.3); and

executing the statement in a third thread (§ 4.1.2).

10. It is noted that Bonachea does not explicitly demonstrate an example of how nesting may be supported. However, the fact that this feature is not discussed does not mean it is not supported. Bonachea discusses the initiation of asynchronous I/O operations, which execute in the background while the foreground application continues. The background application may require further I/O, in which case another asynchronous request may be initiated to complete the processing.

11. As per claims 7 and 9, Bonachea teaches the invention as claimed, including the method of claim 1, wherein the method is executed by an interpreter (§ 2.2) and the second thread is a lightweight thread (§ 4.1.2) (see paragraph 7 above).

12. As per claim 8, Bonachea does not teach the interpreter being a Java virtual machine.

13. Bonachea implements the Java extensions in Titanium, which is actually a dialect of Java and does not utilize a JVM (Abstract; § 2.2). Titanium was developed exclusively at the University of California at Berkeley and functions as a superset of Java. The language extensions defined by Bonachea are for the purpose of adding bulk array operations and enabling asynchronous I/O in Java. However, one of the concerns presented is the portability to other platforms besides Solaris, including those that implement Java within a virtual machine framework (§ 6). As such, it would have been obvious to one of ordinary skill in the art to use the same language constructs on top of a Java Virtual Machine, as this would allow portability between platforms and enable concurrent asynchronous non-blocking execution. The extensions are designed explicitly with Java in mind; it would have been obvious to implement the extensions in Java, as the majority of Java users employ a JVM, rather than the specialized dialects used by Bonachea.

14. As per claims 10-13 and 16, Bonachea teaches the invention as claimed, including an apparatus for performing the method of claims 1-4 and 9, respectively (§ 2.2).

15. As per claims 14-15, Bonachea teaches the invention as claimed, including an apparatus for performing the method of claims 5-6, respectively (§ 2.2).

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16. As per claim 17, Bonachea teaches the invention as claimed, including an apparatus for asynchronous execution within a program, comprising:

an interpreter (§ 2.2); and

a program, the program including a first keyword indicating a code element that may be executed out of order (§§ 4.1.1 - 4.1.3), wherein upon detecting the keyword, a light weight thread is created (§ 4.1.2) and executes the code element in the light weight thread (§ 4.1.2).

17. As per claim 18, Bonachea teaches the invention as claimed, including an apparatus for performing the method of claim 8 (§ 2.2).

18. As per claims 19 and 20, Bonachea teaches the invention as claimed, including a computer program product, a computer readable medium for performing the method of claims 1 and 4, respectively (§ 2.2).

19. As per claims 21-22, Bonachea teaches the invention as claimed, including a computer program product, a computer readable medium for performing the method of claims 5-6, respectively (§ 2.2).

Response to Arguments

20. **Applicant's arguments with respect to claims 1-22 have been considered but are moot in view of the new grounds of rejection.**

21. The differences between Applicant's claims, as amended, and the disclosure of Bonachea have been noted and addressed above in paragraphs 7-8, 10, and 13.

22. **Applicant's arguments with respect to the rejections under 35 USC § 101 have been fully considered but they are not persuasive.**

23. Though Applicant has amended the claims to recite "apparatus" in the body of the claims, the apparatus is still not tangibly embodied. Each limitation recited as part of the apparatus could be a mere software module, which does not qualify as a tangible embodiment for an apparatus.

24. Applicant has requested the date and location where the Bonachea reference has been published. This information had previously been provided on form PTO-892 attached to the Office action dated February 9, 2005. To reiterate, Bonachea was published in June 2000, in the Proceedings of the ACM 2000 Conference on Java Grande. This information is also available on the ACM Digital Library (portal.acm.org/dl.cfm).

Conclusion

25. Applicant's amendment necessitated the new grounds of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Syed J Ali whose telephone number is (571) 272-3769. The examiner can normally be reached on Mon-Fri 8-5:30, 2nd Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Meng-Ai T An can be reached on (571) 272-3756. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Syed Ali
July 25, 2005

MAJID BANANKHAH
PRIMARY EXAMINER
